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Gulpha Sandhi Marma and Pott's Fracture: An Anatomical, Ayurvedic and Clinical Correlation

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Abstract

Gulpha Marma (ankle joint)[1] is described in Ayurvedic *Marma Sharira*[1] as a *Sandhi Marma* located at the junction of *Jangha* (leg) and *Pada* (foot). Injuries to this *Marma* produce classical symptoms including pain (*ruja*), stiffness (*stabdhata*), limping (*khanjata*), and deformity. A corresponding orthopaedic entity is Pott's fracture [4], involving fractures of one or both malleoli with disruption of ankle joint stability.

Objective: To establish a structured correlation between *Gulpha Sandhi Marma* and Pott's fracture from anatomical, physiological, and clinical perspectives.

Methods: Review of Ayurvedic classical texts, modern anatomical literature, and orthopaedic research was conducted. [1, 4] Structural and functional parallels were evaluated to develop a comparative analytical model.

Results: *Gulpha Marma* consists of *mamsa*, *sira*, *snayu*, *asthi*, and *sandhi*—structures that are precisely those injured in Pott's fracture. [1, 4] symptomatically, the clinical features of *Gulpha Marma* injury closely match those observed in Pott's fracture. Treatment principles across both systems emphasize restoring joint integrity and preventing deformity.

Conclusion: Pott's fracture represents a severe form of injury to *Gulpha Sandhi Marma*. [1, 4] The correlation highlights the scope for integrative management combining orthopaedic interventions with principles of *Marma Chikitsa*. Additional clinical studies are necessary.

Keywords: *Gulpha Marma; Sandhi Marma*; Pott's Fracture; Ankle Joint; *Marma* Anatomy; Ayurveda.

1. Introduction

Ayurvedic Marma Sharira describes 107 vital anatomical points where structural components such as *mamsa*, *sira*, *snayu*, *asthi*, and *sandhi* converge.[1] *Gulpha Marma*, located at the ankle joint, holds considerable clinical significance because injury at this site affects stability, movement, and long-term musculoskeletal health.[1]

Pott's fracture is defined in orthopaedics as a fracture involving one or both malleoli, frequently accompanied by ligament damage and ankle mortise disruption. [4]This study systematically correlates these two viewpoints. [2]

2. Anatomical and Ayurvedic Basis of Gulpha Marma

2.1 Classical Definition and Location

Ancient Ayurvedic texts1 describe Gulpha as the articulation between the foot and leg, anatomically correlating with the tibiofibular–talar complex. It is a Sandhi Marma and is assigned a classical measurement1 (*pramana*) of two *angula*.

2.2 Constituents of Gulpha Marma

Ayurvedic Component	Modern Anatomical Equivalent
Mamsa	Muscles/tendons such as peroneals, tibialis posterior etc.
Sira	Tibial vessels, peroneal vessels, superficial nerves
Snayu	Lateral ligaments, deltoid ligament, syndesmotic ligaments
Asthi	Distal tibia, distal fibula, talus
Sandhi	Ankle joint surfaces, capsule, articulating structures

2.3 Clinical Features of Gulpha Injury

- Acute pain[(1)](*ruja*)
- Swelling, tenderness, discoloration[(1)]
- Reduced mobility[(1)](*stabdhata*)
- Difficulty in walking or limping[(1)](*khanjata*)
- Risk of deformity if mismanaged[(1)]

3. Pott's Fracture: Orthopaedic Overview

3.1 Mechanism

Pott's fracture [(4)] is most commonly caused by external rotation or eversion forces acting on the ankle. It may involve fractures of the medial malleolus, lateral malleolus, posterior tibial margin, or combinations thereof.

3.2 Clinical Features

- Severe ankle pain[(4)]
- Oedema, ecchymosis[(4)]
- Point tenderness on palpation[(4)]
- Difficulty bearing weight[(4)]
- Radiographic evidence of malleolar fracture and mortise widening

3.3 Management

- Closed reduction and casting4 for undisplaced fractures
- Open reduction internal fixation (ORIF)[(5)] (ORIF) for displaced fractures
- Goals include restoring joint congruity and preventing chronic arthritis

4. Correlation Between Gulpha Sandhi Marma and Pott's Fracture

4.1 Structural Parallels

The tissues comprising Gulpha Marma correspond to the exact structures affected in Pott's fracture: bones (*asthi*) [(1),] ligaments (*snayu*) [(1)], soft tissues (*mamsa*), vessels and nerves (*sira*), and joint capsule (*sandhi*).

4.2 Symptomatic Overlap

Both conditions present with pain, swelling, restricted movement, and difficulty in weight-bearing. Long-term complications include osteoarthritis and instability4.

4.3 Therapeutic Considerations

Ayurveda emphasizes restoring functional integrity of *Marma*, reducing pain and swelling, and preventing deformity. [(3)] These principles align closely with orthopaedic management strategies.

5. Discussion

The structural and functional correspondence between *Gulpha Marma* and Pott's fracture demonstrates that Ayurveda's *marma* concept effectively identifies clinically significant anatomical zones. [(1)] Integrating both systems may enhance diagnostic accuracy and offer comprehensive treatment options. [(5)]

Limitations include insufficient empirical data on combined treatment outcomes and lack of standardized anatomical correlates of *marma* points. [(2, 6)]

6. Conclusion

Pott's fracture is a severe manifestation of injury to the *Gulpha Sandhi Marma*. Recognizing the overlap enhances understanding of ankle injury mechanics and supports further integrative clinical research.

7. References

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